What is Claimed is:

[c1] A programmable element, comprising:
a first device on a substrate having a first electrode and a first insulator disposed between the substrate and said first electrode, said first insulator having a first value of a given parameter:
a second device on a substrate having a second electrode and a second insulator disposed between the substrate and said second electrode, said second insulator having a second value of said given parameter that is different from said first value;
wherein said first and second electrodes of said first and second devices are coupled to one another; and
a source of programming energy coupled to said first device and causing it to permanently decrease in resistivity,
wherein a programmed state of said first device is indicated by a conductive state of said second device.

[c2] The programmable element of claim 1, wherein said given parameter is selected from the group consisting of density, thickness, and insulative value.

[c3] The programmable element of claim 2, wherein said first insulator has a dielectric breakdown voltage that is less than that of said second insulator.

[c4] The programmable element of claim 3, wherein said first insulator is selected from the group consisting of silicon oxide, silicon nitride, silicon oxynitride, or combinations of two or more of silicon oxide, silicon nitride, and silicon oxynitride.

[c5] The programmable element of claim 3, wherein said first device further comprises a third electrode disposed on the substrate adjacent said insulator of said first device.

[c6] The programmable element of claim 5, wherein said third electrode comprises a diffusion region.

[c7] The programmable element of claim 6, wherein said first electrode comprises a plurality of separate conductive lines, said plurality of separate conductive lines overlaying said diffusion region.

[c8] The programmable element of claim 5, wherein said source of programming energy is

coupled to said third electrode.

[c9] The programmable element of claim 6, wherein said source of programming energy comprises a voltage source.

[c10] The programmable element of claim 2, wherein said first device comprises a diode and said second device comprises an FET.

[c11] The programmable element of claim 10, further comprising a sense latch coupled to a controlled electrode of said FET.

[c12] The programmable element of claim 10, wherein said sense latch changes state when said diode is programmed.

[c13] A programmable element, comprising a programming device comprised of a first integrated circuit element having a first dielectric breakdown voltage and a gain device comprised of a second integrated circuit element having a second dielectric breakdown voltage higher than said first dielectric breakdown voltage, said first and second integrated circuit elements each having at least one electrode, said electrodes being electrically coupled together and to a source of programming energy, said second integrated circuit element conducting current when the first integrated circuit element has been programmed.

Sub 7 A1

[c14] The programmable element of claim 12, wherein said source of programming energy renders said first integrated circuit element permanently conductive when programmed, without rendering said second integrated circuit element permanently conductive.

[c15] The programmable element of claim 13, wherein said first integrated circuit element comprises a diffused electrode that is coupled to said source of programming energy.

[c16] The programmable element of claim 14, wherein said first integrated circuit element comprises a conductive electrode comprised of a plurality of separate conductive lines disposed above said diffused electrode and separated therefrom by an insulator.

[c17] The programmable element of claim 15, wherein said first integrated circuit element comprises a diode and said second integrated circuit element comprises an FET.

[c18] A method of forming an integrated circuit including a programmable element, comprising

the steps of:

forming a first device on a substrate having a first electrode and a first insulator disposed between the substrate and said first electrode, said first insulator having a first value of a given parameter;

forming a second device on a substrate having a second electrode and a second insulator disposed between the substrate and said second electrode, said second insulator having a second value of said given parameter that is different from said first value;

coupling said electrodes of said first and second devices to one another; and

coupling a source of programming energy to said first device.

[c19] The method of claim 17, wherein said given parameter is selected from the group consisting of thickness, density, and insulative value.

[c20] The method of claim 18, wherein said first device and said second device are formed by forming a first dielectric on the substrate;

masking areas on the substrate where said first device is to be formed, so as to expose a portion of said first dielectric where said second device is to be formed;

treating said exposed portion of said first dielectric.

[c21] The method of claim 19, wherein said treatment step comprises forming a second dielectric on said exposed portion of said first dielectric.

[c22] The method of claim 18, wherein said first device and said second device are formed by forming a first dielectric on the substrate;

masking areas on the substrate where said second device is to be formed, so as to expose a a portion of said first dielectric where said second device is to be formed; and

treating said exposed portion of said first dielectric.

[c23] The method of claim 21, wherein said treatment step is selected from the group consisting of implantation of ions causing physical damage to said exposed portion of said first dielectric, implantation of ions altering conductivity characteristics of said exposed portion of said first dielectric, implantation of ions that both cause physical damage to and alter conductivity characteristics of said exposed portion of said first dielectic, and etching said exposed portion of said first dielectric.

[c24] The method of claim 17, wherein said electrode of said first device has conductivity

characteristics that are different from those of said electrode of said second device.

[c25] The method of claim 23, wherein both of said electrodes of said first and second devices are made of polysilicon, said electrode of said first device is implanted with ions at a first concentration, and said electrode of said second device is implanted with ions at a second concentration less than said first concentration.

[c26] The method of claim 17, further comprising
forming a first dopant region below said first electrode; and
forming a second dopant region on either side of said second electrode.

[c27] The method of claim 25, wherein said first dopant region has a dopant concentration that is greater than that of said second dopant region.

[c28] The method of claim 25, wherein said first and second dopant regions abut one another.

[c29] The method of claim 25, wherein said first and second dopant regions are separated by an isolation space, and are interconnected by an overlaying conductor.